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Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554

JAN - 8 1993

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF THE SECRETARY

In the Matter Of:

Amendment of the Commission's  
Rules To Establish New Personal  
Communications Services

)  
) GEN Docket No. 90-314  
) ET Docket No. 92-100  
)  
) RM-7140, RM-7175, RM-7617,  
) RM-7618, RM-7760, RM-7782,  
) RM-7860, RM-7977, RM-7978,  
) RM-7979, RM-7980  
)  
) PP-35 through PP-40,  
) PP-79 through PP-85

**REPLY COMMENTS OF McCaw CELLULAR COMMUNICATIONS, INC.**

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## SUMMARY

The Commission's Notice of Proposed Rulemaking invited public comment on a broad range of PCS allocation, licensing, and regulatory issues. In response, the opening comments reflect a significant consensus that PCS can be best introduced under flexible, open entry policies that maximize the number of opportunities for participants and facilitate the deployment of diverse approaches to consumer needs. Accordingly, a majority of commenters favor policies that allocate spectrum for five providers per market operating with 20 MHz each and licensed to serve MSAs and RSAs.

In contrast, several parties advance parochial or self-serving proposals that seek to artificially restrict the number of competitors in the marketplace. Some advocate allocation of huge blocks of spectrum ranging from 40-65 MHz per licensee with the effect of limiting entry to two service providers per market. Others advocate licensing on a national basis so that only two or three companies can control the fate of PCS for the entire country. Still others seek to arbitrarily limit the number of competitors to promote the economic value of FCC PCS licenses and their attractiveness to investors.

As detailed below, contrived barriers to competition do not serve the public interest. The Department of Justice, the National Telecommunications and Information Administration, the Office of Plans and Policy, and the preponderance of the aspiring PCS providers agree that reliance upon the marketplace will better serve consumers than the industry micromanagement associated with countervailing proposals. Indeed, the experience of the last two decades in telecommunications is a rejection of such notions in favor of pro-competitive policies.

In such respects, the record before the Commission and the past experience in mobile telecommunications services provides compelling testimony for encouraging the participation of cellular carriers. Foreclosing the most qualified, most experienced, and most committed participants in wireless services would unconscionably squander an invaluable resource. Cellular carriers can and should play a pivotal role in achieving the Commission's important vision of PCS's potential for the nation.

Finally, in developing the regulatory framework for new wireless services, the Commission must take affirmative action to ensure that functionally similar services are subject to similar regulatory obligations. The current controversies associated with disparate regulation of common carriers and private carriers simply cannot be shunted aside. The Commission must move promptly to establish consistent, rational regulatory policies for the wireless telecommunications industry of the future.

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**REPLY COMMENTS OF McCaw Cellular Communications, Inc.**

McCaw Cellular Communications, Inc. ("McCaw") herewith submits its reply to comments filed in response to the Commission's Notice of Proposed Rulemaking on Personal Communications Services ("PCS").<sup>1</sup> The opening comments clearly establish that the Commission's policies for promoting new Personal Communications Services should seek to maximize entry opportunities under ground rules that ensure comparable regulatory obligations for functionally similar wireless competitors. In particular, cellular carrier participation in PCS should be encouraged rather than restricted. As detailed below, McCaw and other cellular service providers can play an indispensable role in ensuring the rapid, ubiquitous deployment of diverse new services to the American public.

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<sup>1</sup> *Amendment of the Commission's Rules To Establish New Personal Communications Services*, 7 FCC Rcd 5676 (1992) ["Notice"].

**I. THE RECORD SUPPORTS POLICIES MAXIMIZING OPPORTUNITIES FOR PARTICIPATION IN PCS**

The opening comments reflect an overarching theme that "[i]n crafting a regulatory framework for these new services, the Commission should allow the marketplace, and not government fiat, to shape the development of PCS."<sup>2</sup> The Commission has the opportunity to fashion a PCS regulatory foundation that fosters competition through reliance upon flexible rules and open entry policies, maximizing the diversity of participants and services enjoyed by the public. As the Department of Justice observes, these conditions will best ensure realization of the Commission's PCS goals because "the market will itself establish the economically efficient levels of universality, speed of deployment and diversity of services."<sup>3</sup>

Several fundamental policy consequences flow from this basic consensus principle. The number of PCS allocations, for example, should maximize competition by providing the greatest number of licensed providers possible in the available spectrum. The size of licensing areas should increase, to the extent possible, the number of entry opportunities available. Any limitations on eligibility should be disfavored.<sup>4</sup> And, functionally similar competitors should operate under the same -- rather than disparate -- regulatory ground rules.

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<sup>2</sup> Comments of the National Telecommunications and Information Administration at i ["NTIA"].

<sup>3</sup> Comments of the United States Department of Justice at 7 ["DOJ"].

<sup>4</sup> Ironically, two of the greatest advocates of developing a market-driven framework for PCS, DOJ and NTIA, have advocated limited barriers to cellular entry into PCS. As discussed in Section II, the concerns of DOJ and NTIA regarding cellular entry have been addressed by a number of commenters as well as the FCC's own Office of Plans and Policy.

Indeed, given the wide number of contrary PCS visions expressed by commenters, developing market-responsive regulatory policies is absolutely essential. While all commenters appear to agree that PCS will offer substantial benefits, no commenter has established that any particular PCS network architecture is optimal. Under the circumstances, the FCC must endeavor to avoid allocation and licensing policies that inadvertently favor, or disfavor, any class of PCS systems. As discussed below, self-correcting market-based regulatory mechanisms offer the best means of ensuring that such mistakes do not occur.

**A. THE COMMISSION SHOULD AUTHORIZE AT LEAST FIVE LICENSED 2 GHz PCS PROVIDERS WITH 20 MHz EACH IN ORDER TO FOSTER COMPETITION AND DIVERSITY OF SERVICES**

A substantial number of commenters, representing a diverse range of interests, have supported a competitive market for licensed PCS services with grants of 20 MHz for at least five providers.<sup>5</sup> The record demonstrates that a highly competitive PCS market is the

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<sup>5</sup> This impressive list of commenters includes, in addition to cellular and local exchange carriers, federal government agencies, state utility commissions, trade associations, as well as cable and specialized mobile radio providers. *See, e.g.*, Comments of McCaw Cellular Communications, Inc. at 5-12 ["McCaw"]; Comments of Adelphia Communications Corporation and Newchannels Corporation at 4 ["Adelphia"]; Comments of Alltel Companies at 12-16 ["Alltel"]; Comments of the American Mobile Telecommunications Association at 4 ["AMTA"]; Comments of American Telephone & Telegraph Company at 10-11 ["AT&T"]; Comments of Bell Atlantic Personal Communications, Inc. at 32-39 ["Bell Atlantic"]; Comments of BellSouth at 20-23 ["BellSouth"]; Comments of the People of the State of California and the Public Utilities Commission of the State of California at 1-2 ["California"]; Comments of Cellular Communications, Inc. at 1-2 ["CCI"]; Comments of the Cellular Telecommunications Industry Association at 28-30 ["CTIA"]; Comments of Centel Corporation at 10 ["Centel"]; Comments of Chesnee Telephone Company at 1 ["Chesnee"]; Comments of Comcast PCS Communications, Inc. at 18-21 ["Comcast"]; Comments of Fleet Call, Inc. at 8-9 ["Fleet Call"]; Comments of GTE Corporation at 28-32 ["GTE"]; Comments of Lincoln Telephone and Telegraph Company at 9 ["Lincoln"]; NTIA at 6-7; Comments of the New York State Department of Public Service at 5-8 ["New York"]; Comments of NYNEX Corporation at 26-27 ["NYNEX"]; Comments of Pass Word, Inc. at 2-3 ["Pass Word"] (continued...)



optimal means of assuring the rapid availability of a ubiquitous and diverse range of PCS offerings for the American public. Moreover, as discussed below, the arguments in favor of larger spectrum grants, or fewer competitors, lack credible support or rely on erroneous assumptions regarding the delivery of PCS offerings. Accordingly, McCaw believes the Commission should authorize five licensed PCS providers with 20 MHz each.

The comments of the United States Small Business Administration are representative of commenters favoring five competitive providers, stating that five licensees "ensure[] a sufficient number of entrants to provide a freely competitive market . . . keep[ing] prices low and consumer and small business utilization of PCS high"; "maximize[] . . . the opportunity for small businesses to participate as a provider of PCS"; and "ensure rapid deployment of as complete a PCS network as possible."<sup>6</sup> BellSouth supplements this list by noting that five providers will "develop a variety of low-power microcell networks oriented to many different consumer needs" and a 20 MHz allocation "is more spectrally efficient than an allocation of significantly larger blocks of spectrum."<sup>7</sup>

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<sup>5</sup>(...continued)

Word"]; Comments of the Pennsylvania Public Utility Commission at 4 ["Pennsylvania"]; Comments of Piedmont Rural Telephone Cooperative, Inc., West Carolina Rural Telephone Cooperative, Inc., and Farmers Telephone Cooperative, Inc. at 2 ["Piedmont"]; Comments of Rochester Telephone Corporation at 13 ["Rochester"]; Comments of Rock Hill Telephone Company, Fort Mill Telephone Company, and Lancaster Telephone Company at 4 ["Rock Hill"]; Comments of Rural Cellular Corporation at 1-2 ["Rural Cellular"]; Comments of the South Carolina Telephone Association at 3 ["SCTA"]; Comments of Southern New England Telecommunications Corporation at 6-7 ["SNET"]; Comments of Telephone and Data Systems, Inc. at 5-8 ["TDS"]; DOJ at 3-4, 7-10; Comments of the United States Small Business Administration, Chief Counsel for Advocacy at 10-12 ["USSBA"]; Comments of the United States Telephone Association at 31 ["USTA"]; Comments of Vanguard Cellular Systems, Inc. at 3-7 ["Vanguard"].

<sup>6</sup> USSBA at 10-11. *See also* n.5, *supra*.

<sup>7</sup> BellSouth at 22. *See also* n.5, *supra*.

These views are confirmed by a recent Office of Plans and Policy working paper.<sup>8</sup> The *OPP Paper* documents that the PCS market will support at least five providers and unlicensed services in the 1850-1990 MHz band. By modeling several licensing scenarios, the *OPP Paper* found that at a PCS subscriber rate of 30 percent, six firms could compete (using the telephone network for switching and transport) with only minimal losses in economic efficiency.<sup>9</sup> The *OPP Paper* further notes that issuing five or six licenses serves the Commission's goal of extending the benefits of competition to the PCS market because the threat of competitive entry will tend to lower prices, improve service and provide incentives to use the spectrum in diverse and productive ways, whereas having only a smaller number of licenses could increase acquisition costs beyond the financial reach of small firms.<sup>10</sup> In addition, a competitive environment will create strong incentives for providers to develop PCS quickly.<sup>11</sup> Finally, the *OPP Paper* warns that limiting the number of licensees might reduce the number of potential infrastructure providers, and thus fail to exploit potential economies of scope.<sup>12</sup>

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<sup>8</sup> David P. Reed, *Putting it All Together: The Cost Structure of Personal Communications Services*, Office of Plans and Policy, November 10, 1992 [*"OPP Paper"*].

<sup>9</sup> *OPP Paper* at 50. In fact, the difference in total annualized costs between one provider and six providers would be about \$10 per month per subscriber. *Id.* Moreover, the marginal costs of adding providers decreases with each successive entrant, which means that allowing up to six providers adds only small incremental costs. *Id.* at 52.

<sup>10</sup> *Id.* at 52.

<sup>11</sup> *Id.* at 53.

<sup>12</sup> *Id.*

As a final matter, OPP and many other commenters have cautioned that if the Commission is to err in initially establishing the number of licensed PCS providers, it should err on the side of too many.<sup>13</sup> If too many competitors are authorized, market consolidation will occur, and thus "while authorizing 'too many' providers is self-correcting, authorizing 'too few' is not."<sup>14</sup> NTIA further elaborates on this point, stating that "consumers may not be appreciably harmed, in the long run, by initially assigning 'too many' licenses, while the cost of assigning 'too few' -- high rates for service and other characteristics of less than fully competitive markets -- could potentially be significant and persistent."<sup>15</sup> Thus, as DOJ states, "the Commission should . . . allocate as many licenses as available spectrum permits. . . ."<sup>16</sup>

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<sup>13</sup> *Id.* OPP notes that "[t]he policy objective of extending the benefits of competition is still best served by having more licenses than actual suppliers given that spectrum constraints have been met." *Id.* OPP notes, in particular, that authorizing too many licensees will allow "economic forces" "to determine the appropriate number of competitors," "the threat of competitive entry by the other licensees will serve as a market check," and "licensees will still have the flexibility and incentives for innovation to find a niche market for wireless services and otherwise use the spectrum in productive fashion." *Id.*; *see also* Bell Atlantic at 33-35; GTE at 32; NTIA at 6.

On the other hand, OPP argues that APC's solution -- the FCC ability to issue more licenses at a later date -- "is not likely to be efficient for a number of reasons." *OPP Study* at 52. Specifically, OPP notes that its cost study suggests that "up to six licenses could be issued while still satisfying constraints on spectrum requirements," that "there could be significant delays in issuing subsequent PCS licenses, especially given that incumbent PCS licensees will find it in their interests to delay the entry of potential competitors," and that "allowing all PCS licensees entry into the market at the same time would allow each licensee equal access and opportunity to develop the market." *OPP Study* at 52.

<sup>14</sup> GTE at 32; *see also* Bell Atlantic at 34; CCI at 6-7; CTIA at 30; NTIA at 6-7.

<sup>15</sup> NTIA at 6-7. In this regard, NTIA notes that "assigning 'too many' licenses could impose costs upon society, at least in the short run, to the extent that firms may not realize available economies of scale." NTIA at 7 n.9. *See also* DOJ at 11. As discussed later, however, OPP has shown that a competitive market with five providers will allow each provider to exhaust all economies of scale. *See* Section I.B, *infra*.

<sup>16</sup> DOJ at 14.

**B. THERE IS NO BASIS FOR ALLOCATING HUGE BLOCKS OF SPECTRUM THAT UNNECESSARILY REDUCE ENTRY OPPORTUNITIES**

Several parties advocate allocating large blocks of spectrum to justify two service providers in each market. These commenters have not attempted to justify such allocations on a technical basis, *i.e.*, by rigorously demonstrating that 20 MHz of clear spectrum is required to satisfy demand for PCS.<sup>17</sup> Rather, they have resorted to arguments that PCS allocations should be "comparable" to 800 MHz cellular allocations, that larger allocations are needed to compensate for the presence of existing fixed microwave users, or that the Commission should artificially manipulate the market to make PCS providers attractive to investors. As discussed below, none of these arguments present a reasoned basis for inflating spectrum grants beyond the amount required to deploy new 2 GHz PCS offerings. And, as shown by OPP and other commenters, 20 MHz is a sufficient, even generous, allocation for introducing new PCS offerings.

*Arguments for cellular comparability are misplaced.* As an initial matter, assuming cellular comparability is an appropriate goal,<sup>18</sup> new PCS providers employing new digital

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<sup>17</sup> McCaw believes that 10 MHz of clear spectrum is likely to be sufficient, and nothing in the record would contradict such a position, other than the Telocator Study, which has been shown to lack a factual basis. *See* n.48, *infra*; *see also* McCaw at 7-8 (Noting that DECT utilizes 20 MHz to support traffic densities of 10,000 Erlangs per square kilometer).

<sup>18</sup> One commenter objected to the *Notice's* emphasis of PCS comparability with 800 MHz cellular service as legally indefensible. BellSouth at 62-68. First, this proceeding's stated goal is to establish *new* PCS offerings, and the regulatory scheme adopted must be consistent with and appropriate for this goal and with the PCS record to date. Second, the record before the Commission regarding PCS involves almost exclusively low-power microcellular systems and deviating from the record to authorize cellular "look-alike" services may violate administrative decisionmaking laws. *Motor Vehicle Manufacturer's Ass'n v. State Farm*, 463 U.S. 29 (1983). Third, BellSouth has also noted that Commission has responsibility to identify its real agenda:

(continued...)

technologies would require far less than 25 MHz to achieve capacity comparable to cellular carriers. Fleet Call's Enhanced Specialized Mobile Radio ("ESMR") system, for example, employs roughly 12.5 MHz of spectrum but achieves cellular comparability through digital technology. As its comments note, a 15 MHz allocation would approximate cellular capacity today.

Cellular, operating with 25 MHz, also is subject to architectural capacity constraints not faced by new providers. Commenters have noted that 800 MHz cellular capacity is limited by a continuing practical requirement to maintain service to an extensive base of existing analog customers and roamers. In addition, 800 MHz cellular services are provided through a macrocellular architecture that may not, in all areas, be able to increase capacity by transforming into a microcellular system because such an architecture may no longer be capable of supporting vehicular traffic.<sup>19</sup>

Moreover, commenters have generally refuted the idea that PCS should be comparable to 800 MHz cellular.<sup>20</sup> Omnipoint, for example, observes that:

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<sup>18</sup>(...continued)  
increased cellular competition or new services and technologies. See *Greater Boston*, 444 F.2d 841, 850-852 (D.C. Cir. 1970), *cert. denied* 403 U.S. 923 (1971).

<sup>19</sup> See, e.g., McCaw at 24; Bell Atlantic at 9; BellSouth at 69 n.153; CTIA at 67; Comcast at 10.

<sup>20</sup> See, e.g., McCaw at 8-9; Comments of American Petroleum Institute at 12 ["API"]; Comments of Ameritech at 4 ["Ameritech"]; Comments of the Association of American Railroads at 3 ["AAR"]; BellSouth at 6-11 & 62-69; Comments of Cellular Service, Inc. at 8-9 ["CSI"]; Centel at 31-32; Comments of Cox Enterprises, Inc. at 3-4 ["Cox"]; CTIA at 55-58; Comments of Florida Cellular RSA Limited Partnership at 15 ["Florida"]; GTE at 20-22; Lincoln at 4; Comments of Matsushita Communications Industrial Corporation of America at 5 ["Matsushita"]; NTIA at 4-5; Comments of Omnipoint Communications, Inc. at 7-9 ["Omnipoint"]; Comments of Sprint at 5-6 ["Sprint"]; DOJ at 19-21; USTA at 5-7.

For PCS to offer wireless services at lower per minute costs and lower handset costs than cellular, PCS must be launched with a different network architecture. . . . PCS, if deployed differently, offers a one time opportunity for the consumer to gain wireless access to wireline quality voice and data services at costs that will resemble the wireline network.<sup>21</sup>

If it were to "recreate" the 800 MHz cellular allocations in the 2 GHz band, the Commission would simply be encouraging new providers to implement upbanded cellular systems instead of newer, more spectrally efficient technology. Consequently, the Commission may lose a valuable opportunity to increase the communications options available to the public.<sup>22</sup>

Under the circumstances, "[g]iven that new spectrum allocations offer the opportunity to create new offerings based on microcellular technologies, . . . the better objective would be to foster innovative offerings and new alternatives for consumers."<sup>23</sup>

*Arguments calling for large spectrum blocks to compensate for the presence of existing users are misplaced.* Commenters proceed from notions of "cellular comparability," which would suggest grants of at most 25 MHz, to requests for 40 MHz or more by arguing

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<sup>21</sup> Omnipoint at 1. From this premise, Omnipoint argues for much broader allocations than 800 MHz cellular systems. If the Commission supports broader allocations based upon this rationale, however, it is clear that cellular and PCS are not intended to be competitive substitutes, and any purported rationale for a cellular exclusion would be completely undermined.

<sup>22</sup> Indeed, commenters have even suggested that high power "cellular look-alike" and low power microcellular PCS systems may be mutually exclusive. Ameritech states, for example, that "[a]ttempting to accommodate both high power and low power operations may delay the standards process and force compromises in standards which increase the costs of both infrastructure and end-user equipment." Ameritech at 4; *see also* BellSouth at 13-20; Omnipoint at 14; USTA at 3.

<sup>23</sup> GTE at 21.

that PCS providers must share with existing fixed microwave users of the spectrum.<sup>24</sup> The arguments ignore, however, substantial efforts to allow for voluntary and involuntary relocation of existing users, appear to contradict prior claims regarding the ability of PCS systems to co-exist with existing users, and fail to acknowledge several practical realities of PCS deployment. As discussed below, accommodating existing users can be accomplished and new services rapidly and economically deployed without granting excessive spectrum to new licensees.

First, adequate clear spectrum appears to be available even if no users are relocated. American Personal Communications attempts to argue that providing for five licensees would result in huge exclusion zones, but even APC notes that each provider with a 20 MHz allocation would have access to at least some spectrum, on average, in 70.3 percent of New York City,<sup>25</sup> the largest market in the country. Furthermore, if only two microwave links per licensee are relocated, each of five licensees would have access, on average, to spectrum in 89.16 percent of the New York City metropolitan area.<sup>26</sup> McCaw recognizes that limiting the allocations to two licensees would allow each to cover a roughly equivalent

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<sup>24</sup> See, e.g., Comments of American Personal Communications at 17-19 ["APC"]; Comments of Associated PCN Company at 2-4 ["Associated PCN"]; CSI at 5; Cox at 8-9; Comments of MCI Telecommunications Corporation at 4-8 ["MCI"]; Omnipoint at 11-12; Comments of PerTel, Inc. at 2-6 ["PerTel"]; Comments of Time Warner Telecommunications at 4-7 ["Time Warner"].

<sup>25</sup> APC at 13. Indeed, in Washington, D.C., five licensees with 20 MHz would have, on average, have spectrum available in 91.44 percent of the city, without relocating any microwave links. *American Personal Communications Report on Spectrum Availability* at Chart 1, GEN Docket 90-314 (Nov. 20, 1992) ["APC Supplemental Filing"].

<sup>26</sup> *Id.* at Attachment A "New York PCS Spectrum Availability."

percentage of the New York City area without relocating any links at all.<sup>27</sup> But, for the cost of relocating two links per licensee, estimated at approximately \$200,000 (less than the cost of a single analog cell site),<sup>28</sup> comparable coverage would be achieved for five licensees rather than two.

Second, commenters' current statements conflict with prior claims about PCS's ability to share with existing users in the 2 GHz band.<sup>29</sup> In APC's comments on the *PCS Notice of Inquiry*, for example, it stated:

Where [the 1850-1990 MHz frequencies] are only partially occupied as is the case in Washington, D.C., and other large markets, PCS systems can be engineered to operate around existing microwave users. In some large markets, however, existing microwave licensees occupy all or virtually all of the 1850-1990 MHz band. Even here, CDMA technologies could provide the means by which PCS is implemented without causing interference to existing microwave licensees.<sup>30</sup>

In addition, in its supplemental filing, APC notes it "does not advocate that operating PCS systems use simple exclusion zones to provide interference protection to OFS microwave licensees," noting that "APC has developed its FAST System, which combines theoretical interference analyses with measured data to control PCS frequency use to allow PCS systems

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<sup>27</sup> APC at 13.

<sup>28</sup> *Creating New Technology Bands for Emerging Telecommunications Technology* at 32, FCC/OET TS92-1 (Jan. 1992) [*"OET Report"*].

<sup>29</sup> Ironically, APC's apparent reversal occurred only after being granted a tentative Pioneer's Preference for its Frequency Agile Sharing Technology, which would "use spectrum not used by existing microwave operations to avoid interference with the microwave operations." *Notice* at 5686.

<sup>30</sup> Comments of APC at 11-12, GEN Docket 90-314 (filed Oct. 1, 1990) [*"1990 APC Comments"*].



and OFS facilities to share the 1850-1990 MHz band without mutual interference."<sup>31</sup> By granting excessive spectrum to new entrants in the 2 GHz band, the Commission would reverse prior incentives to develop and deploy new sharing technologies.

Furthermore, a cursory examination of APC's assumptions regarding the exclusion zones shows that they are indeed excessively conservative. In particular, APC assumes:

- An exclusion zone radius of 4.0 miles *in all directions* around a microwave receiver, or over 50 square miles, and an exclusion zone radius of 25.75 miles in an beamwidth arc of 10°, a swath of approximately 58 square miles.<sup>32</sup> Thus, for each receiver, a total exclusion zone potentially greater than 107 square miles is created. Under the circumstances, it is indeed not surprising that sharing appears difficult.
- The use of frequency division duplex ("FDD") rather than time division duplex ("TDD"), and accordingly "if either side of the frequency pair is unavailable at any given grid point, both sides are removed from the available frequency list for that grid point."<sup>33</sup> However, for a 30 mile path, using APC's analysis would create an exclusion zone of approximately 154 square miles even though either the 10 MHz transmit channel or the 10 MHz receive channel spectrum would be available to a TDD PCS provider in all but approximately 40 square miles of that area.<sup>34</sup>

APC acknowledges, in fact, that "[t]he exclusion zones utilized in the July 1991 Report are not flexible enough to be utilized for actual PCS system design nor were they intended to be put to this type of use."<sup>35</sup> Nevertheless, APC professes that they are "a useful device for

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<sup>31</sup> *APC Supplemental Filing* at 13.

<sup>32</sup> *APC Supplemental Filing* at 13.

<sup>33</sup> *Id.* at 17.

<sup>34</sup> Since approximately 18 percent of McCaw's path lengths in the 2110-2130/2160-2180 MHz band, a band where average paths are shorter than the 1850-1990 MHz OFS band, are greater than 25 miles, this would seem to be a significant factor.

<sup>35</sup> *APC Supplemental Filing* at 13.

obtaining valuable information on spectrum sharing which can be used for policy decisions."<sup>36</sup>

Third, APC's analysis concentrates only on the largest, most densely populated areas. As APC has acknowledged, however, "[w]here the 1850-1990 MHz frequencies are unoccupied by microwave users *as is the case in almost all smaller markets*, they can be used immediately for PCS."<sup>37</sup> In markets with fewer fixed links, doubling the allocation size would do no more limit the number of competitors, promoting spectral inefficiency. Accordingly, the spectrum APC believes is needed to deploy PCS in New York City certainly should not constitute a basis for a PCS allocation across the United States.

Fourth, APC's analysis appears premised on the idea that licensees must be able to provide blanket coverage across an entire city in order to compete effectively. Yet, in its comments earlier this year, APC stated:

Blanket coverage of every nook and cranny of metropolitan areas may not be economic or necessary initially. Rather, ubiquitous coverage of the areas in which consumers are likely to use CT-2 and PCS handsets -- discrete neighborhoods, downtown areas, combined work and recreation areas such as Baltimore Harborplace, and shopping areas -- will be necessary to gain consumer acceptance.<sup>38</sup>

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<sup>36</sup> *Id.*

<sup>37</sup> 1990 APC Comments at 11 (emphasis added).

<sup>38</sup> Letter from Wayne N. Schelle, Chairman of APC, and J. Barclay Jones, Vice-President of Engineering of APC, to Hon. Alfred C. Sikes, Chairman of the FCC at 7 (dated Jan. 15, 1992).

Furthermore, as APC also noted, "[m]ore than 90 percent of all OFS usage is more than 10 miles from city centers, where PCS subscriber densities are likely to be greatest."<sup>39</sup> Thus, even with 20 MHz allocations, licensees would appear to be able to compete on the basis of coverage, as well as diversity and cost of service, without needing clear spectrum across an entire metropolitan area.

Finally, requests for vast spectrum allocations do not acknowledge that postulated demand for PCS will not materialize at once and PCS providers can incrementally relocate existing users as capacity shortfalls occur. APC, in fact, emphasized "*[t]hat a PCS allocation might not be implemented immediately in a few markets should not delay a prompt, nationwide allocation for PCS*,"<sup>40</sup> ostensibly recognizing that the peculiar needs of the highest ranked markets should not constitute a baseline for a PCS allocation. Thus, the Commission should proceed with its allocation recognizing that "[w]hile PCS system providers may initially be required to co-exist with existing 2 GHz incumbents, they will have ample time to buy out or relocate fixed microwave users before the PCS system capacity is unduly constrained."<sup>41</sup>

McCaw recognizes that in some extraordinary circumstances, new providers will be required to relocate existing licensees. Unique requirements for a few markets, however, should not be the basis for policies that tie up spectrum across the country. Instead, as

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<sup>39</sup> Statement of J. Barclay Jones, Vice President for Engineering, American Personal Communications at 4, FCC PCS *En Banc* Hearing (Dec. 5, 1991).

<sup>40</sup> 1990 APC Comments at 12 (emphasis in original).

<sup>41</sup> GTE at 30.

discussed in Section IV, McCaw urges the Commission to adopt a financial qualifications showing requirement for PCS applications that includes the cost of any necessary relocations. In this manner, the Commission would treat relocation of existing users, where necessary, as a cost of business rather than as the basis for constricting overall entry opportunities.

*The Commission should not artificially limit competition to ensure market viability.*

As a final matter, some commenters have coupled inflated spectrum allocations with arguments that the Commission should create an artificial shortage of providers to ensure that investors will find PCS attractive.<sup>42</sup> This market distortion is totally at odds with any notions of maintaining a competitive ideal and has been broadly and stridently opposed.<sup>43</sup> DOJ, for example, "strongly disagrees with the suggestion of commenters that 'the number of licensed providers should be limited due in part to the cost of developing a PCS infrastructure.'"<sup>44</sup> The conclusion is also flatly contradicted by the findings of OPP, which found that the potential PCS market could support at least 6 licensed providers.<sup>45</sup> Thus,

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<sup>42</sup> See, e.g., APC at 15-18; Comments of Ericsson Corporation at 7-8 ["Ericsson"]; Comments of PCN America, Inc. at 5 ["PCNA"]; PerTel at 3-4, 6; Comments of ROLM at 13-16 ["Rolm"]; Time Warner at 11.

<sup>43</sup> See, e.g., McCaw at 11; Bell Atlantic at 34-35; CTIA at 30-34; GTE at 31-32; NTIA at 6-7; DOJ at 15.

<sup>44</sup> DOJ at 15 (citations omitted).

<sup>45</sup> OPP Paper at 50. OPP also states "[w]hile there is certainly no guarantee that investment in a PCS system will be profitable, a policy that seeks to minimize investment uncertainty by artificially constraining the availability of PCS licenses is not certain to speed up the rollout of PCS. . . . [because] limiting the number of PCS could delay or limit service provision as suppliers restrict output to increase prices and are less responsive to service requests." *Id.* at 52.

"arguments that the Commission should manage the number of market opportunities to promote the industry's attractiveness to investors are simply outdated and misplaced."<sup>46</sup>

*The inherent technical requirements for PCS can be satisfied with an allocation of 20 MHz.* In contrast to the nontechnical, comparative arguments purportedly supporting large spectrum allocations, commenters and OPP have provided specific record evidence attesting that 20 MHz is more than sufficient to introduce a variety of new PCS offerings in the 2 GHz band. Several commenters, for example, note that new Enhanced Specialized Mobile Radio ("ESMR") deployment offers a pragmatic check on spectrum estimates needed for PCS. In this regard, several parties have observed that Fleet Call's ESMR system has sufficient capacity to accommodate approximately 450,000 users with a total of only 15 MHz of non-contiguous spectrum. Fleet Call itself argues that:

[A] 15 MHz per licensee assignment would provide each licensee more capacity than today's analog cellular systems through using spectrum conserving technologies, such as six times analog Time Division Multiple Access technology.<sup>47</sup>

Accordingly, while no credible evidence exists that technical spectrum requirements for new 2 GHz offerings will exceed 20 MHz, a wealth of record evidence suggests that 20 MHz allocations are, if anything, generous.

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<sup>46</sup> GTE at 32.

<sup>47</sup> Fleet Call at 9. *See also* McCaw at 9; GTE at 31.

This conclusion is further supported by the specific, detailed modeling conducted by OPP. In contrast to the unsupported Telocator spectrum estimates report,<sup>48</sup> the *OPP Paper* clearly identifies that its "base case . . . assumes a duplex channel size of 25 kHz and a frequency reuse factor of N=7," and "assumes a 1 percent grade of service, and that each subscriber offers an average of 0.03 Erlangs during the busy hour."<sup>49</sup> From these assumptions, which OPP defends as reasonable in comparison to other known services,<sup>50</sup> OPP develops cost models for deployment at various penetration rates.<sup>51</sup> Once the model was constructed, OPP determined that at a subscriber penetration rate of 10 percent, switching, wireline transport, fiber optical transport, and total capital costs per customer using 25 MHz or 10 MHz were identical.<sup>52</sup> Significantly, varying the grade of service and

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<sup>48</sup> The only purported study of technical implementation criteria for PCS rationalizing larger allocations, the oft-cited Telocator *PCS Spectrum Requirements* study, is devoid of any factual basis for its conclusions. Telocator PCS Technical and Engineering Committee, *Telocator Spectrum Estimates for PCS Report* (May 28, 1992). As McCaw noted in its original comments, however, the Telocator study masks a host of economic questions. McCaw at 7-8. No where does Telocator explain how its spectrum estimates are derived from the voice coding rates, channel sizes, and re-use factors listed. Telocator's estimates must assume a cell size for a hypothetical serving population density, but these figures are never detailed or defended. These factors, of course, can be altered, with resultant impact on the economics of delivering PCS to the public. No assumed cost of delivery is, however, shown in the Telocator analysis or justified as a limiting factor.

<sup>49</sup> *OPP Paper* at 6-7. OPP's assumption is purportedly based on the cellular service. It has been McCaw's experience, however, that typical cellular calling patterns show subscribers offering only 0.012 Erlangs per busy hour. In any event, OPP's model varied the number of Erlangs up to 0.12 per user, and found "no substantial increase in economies of scale even under very heavy levels of demand." *Id.* at 23.

<sup>50</sup> *Id.* at 8-27. OPP's cost model is based upon a set of carefully derived base case assumptions for each PCS network parameter. *Id.* at 4 and Appendix C. These assumptions are further bolstered by OPP's sensitivity analysis, which tests how the results of the cost model vary with changes to significant base case assumptions, such as network complexity, average offered traffic, radio channel size, spectrum re-use factor, and grade of service. *Id.* at 21-25.

<sup>51</sup> *Id.*

<sup>52</sup> *Id.* at 12, 15, 18 & 21.

the penetration rate did not significantly alter relative costs. Under these conditions, and after additional analysis, OPP finds its model "suggests a large amount of spectrum is not necessary to deliver PCS using microcell sizes between 1.6 km and 400 meters" and concludes "that 20 MHz may be a sufficient spectrum allocation size to implement low-cost PCS systems."<sup>53</sup>

**C. COMMENTS HAVE SHOWN THAT MSA/RSA LICENSING BEST SERVES THE GOAL OF MAXIMIZING COMPETITION**

The record in this proceeding provides specific and well-reasoned support for PCS licensing using Metropolitan Statistical Area/Rural Service Area ("MSA/RSA") market divisions.<sup>54</sup> Not only have commenters extensively discussed the benefits of using MSAs and RSAs, the record also pointedly notes the significant disadvantages of using any larger areas proposed in the *Notice*, whether national, based on Rand McNally Major or Basic Trading Areas ("MTAs" or "BTAs"), or Local Access and Transport Areas ("LATAs"). Furthermore, the recent proposal tendered by MCI for national consortia also suffers severe defects. Accordingly, McCaw believes the Commission should use MSA and RSA divisions to license new 2 GHz PCS providers.

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<sup>53</sup> *Id.* at v.

<sup>54</sup> *See, e.g.*, McCaw at 14-18; Alltel at 12-15; AMTA at 7-9; BellSouth at 30-35; Centel at 11-12; Comments of Century Cellnet, Inc. at 10 ["Century"]; Chesnee at 1; Comments of Cincinnati Bell Telephone at 15-16 ["CBT"]; CSI at 2-3; CTIA at 34-57; Fleet Call at 5-7; GTE at 32-35; NYNEX at 22-24; Comments of Palmetto Rural Telephone Cooperative, Inc. at 2-3 ["Palmetto"]; Pass Word at 4; Rochester at 16-18; Rural Cellular at 2; Comments of Southwestern Bell Corporation at 20-22 ["SWB"]; Piedmont at 2; Sprint at 3-7; DOJ at 19-23; USTA at 20-22; Vanguard at 11-12; Comments of Viacom International, Inc. at 17-18 ["Viacom"].

**1. The Comments Have Shown Great Benefits Through the Use Of MSA/RSA Licensing**

The comments have noted significant, tangible benefits accruing from the use of MSA/RSA licensing for new 2 GHz PCS. Most importantly, as discussed below, MSA/RSA divisions offer increased entry opportunities, fostering diversity, innovation, rapid deployment, and localism. In addition, MSAs and RSAs have the benefit of being suited to the microcellular characteristics of new 2 GHz offerings; constitute well-known, administratively simple boundaries; and would facilitate the integration of new PCS offerings with existing 800 MHz cellular services.

The greatest and most significant benefits of MSA/RSA licensing result from the relatively large number of entry opportunities available to prospective new entrants. Broad entry opportunities, as recognized by many commenters, encourage diversity and innovation of services.<sup>55</sup> CTIA notes, for example, that "with more participants in the embryonic PCS marketplace, innovation and creativity will be fostered."<sup>56</sup> DOJ similarly states "[g]ranting smaller licenses will increase the number of potential competitors (and indeed innovators),"<sup>57</sup> and "the addition of more competitors to wireless markets may also encourage providers to seek out niche markets with differentiated products. . . ."<sup>58</sup> Thus, if

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<sup>55</sup> See, e.g., McCaw at 15; Alltel at 12; BellSouth at 31-32; Centel at 12; CBT at 16; CSI at 3-4; CTIA at 34-57; Fleet Call at 6-7; GTE at 33-34; Palmetto at 2-3; Rock Hill at 5; SNET at 7; Sprint at 3-4; USTA at 19-20; Vanguard at 11-12; Viacom at 17-18.

<sup>56</sup> CTIA at 53.

<sup>57</sup> DOJ at 18.

<sup>58</sup> DOJ at 20.



larger licensed areas are used, the availability of the most diverse and innovative range of services for the public will not be achieved.

In a related argument, the record has also demonstrated that MSA and RSA licensing advances important public policies by fostering localism.<sup>59</sup> For example, "[f]irms that might have the capital, facilities. . . , expertise, or consumer confidence to be the most efficient competitors in a local market may lack the ability to compete effectively across a larger area."<sup>60</sup> By using MSA/RSA divisions, smaller applicants will be able to apply "where they have first-hand knowledge of the communities, businesses and government."<sup>61</sup> This receptiveness to local concerns is especially important in less densely populated areas that may not support a full range of PCS offerings, and "[r]ural areas will benefit from service providers whose incentives are to focus on their unique needs."<sup>62</sup>

In addition, commenters persuasively show that the use of MSA/RSA licensing promotes rapid, ubiquitous service, especially to rural areas.<sup>63</sup> Sprint, for example, notes

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<sup>59</sup> See, e.g., McCaw at 13-14; Alltel at 13; BellSouth at 30-32; CTIA at 48, 52-53; Centel at 12; Century at 11-12; CSI at 4; GTE at 33-34; NYNEX at 23; Palmetto at 2; Sprint at 4; USTA at 20; Vanguard at 12. APC and MCI have also argued, in contrast, that larger areas will promote rural development and involvement by small businesses. However, unlike APC and MCI, who would confine such entities to marginal roles as "franchisees" or "participants in PCS through equipment supply and installation, maintenance, marketing, provision of unlicensed services . . . , and dozens of other service and support industries," MSAs and RSAs offer genuine entry opportunities as licensees, and thus allow small providers to contribute to the diversity of PCS offerings. APC at 34, 36; MCI at 12.

<sup>60</sup> DOJ at 21.

<sup>61</sup> Sprint at 3-4.

<sup>62</sup> CTIA at 53.

<sup>63</sup> See, e.g., McCaw at 16-17; Alltel at 13; BellSouth at 32; CTIA at 53; Comments of Concord Telephone Company at 4 ["Concord"]; NYNEX at 24; Palmetto at 2; Piedmont at 2; Rock Hill at 5; USTA at 20-21; Vanguard at 12.